

PATHFINDER

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An informal newsletter produced for the GPS user community by Army PM GPS, Fort Monmouth, NJ. Information presented is based on published and submitted news items of interest to the general user. Widest dissemination and reproduction is encouraged. Newsworthy items are solicited for inclusion. Editor Mr. Don Mulligan at PM GPS, Ft Monmouth NJ DSN 992-6137 or (732) 532-6137 or email: Donald.Mulligan@jewsonmouth.army.mil

The PATHFINDER can be found online at the PM GPS web page: <http://army-gps.robins.af.mil>

PM's CORNER

Hello GPS Users!

It's great to be the new Army Product Manager for GPS at a time when the DAGR is moving into First Article testing! That means production and fielding of this much-needed new military GPS product is getting closer! At the same time I look forward to working with the new office of Project Manager for Navigation Systems (PM NAV SYS) to prep the Army community for the next-generation "GPS on a card" called GRAM. Between DAGR and GRAM we will maintain the military edge over commercial GPS receiver technology. And elsewhere in this issue is a report on the new GPS-based survival radio system called CSEL. As exciting as the new stuff is, I remind you to maintain proficiency and the readiness of currently fielded systems, namely the PLGR. That's what you're going to use in any near term deployment so be ready! If you need assistance, contact my staff here in California or at the Georgia or New Jersey offices.

LTC Skip Harborth

DAGR FIRST ARTICLE CONTRACT AWARD!



The two competing versions of DAGR are shown flanking a standard PLGR in approximate scale relationship. Both DAGR models shown are Technical Bid Sample designs. The First Article production representative models and the final production version DAGR will vary in size and final configuration from the samples shown here. Note one model uses an integrated antenna while the other has a PLGR-style flip up antenna.

What is DAGR?

The Defense Advanced GPS Receiver (DAGR) is the planned replacement for the military's current handheld Global Positioning System (GPS) receiver, the AN/PSN-11(V) Precision Lightweight GPS Receiver (PLGR). Since introduction in 1994, over 100,00 PLGR have been fielded to all branches of the US military, providing soldiers and weapons systems with handheld, vehicle-mounted and system-integrated GPS data.

How does DAGR compare to PLGR?

As the next-generation GPS receiver, DAGR builds upon the performance design of the PLGR. The DAGR will be backwards-compatible with the PLGR. It will do everything a PLGR does. Some things it will do better. It will provide the same Position, Velocity and Timing (PVT) data that PLGR provides to users and host systems, but it will be less than half of the weight and 2/3 the size of PLGR, making it more portable for soldiers who already carry a heavy load.

The DAGR will replace the PLGR for most dismounted soldiers. DAGR will also replace PLGR in many platforms where the PLGR is installed to provide PVT data to wheeled or tracked vehicle operators or weapons or communications systems.

Does DAGR do Anything different from PLGR?

Yes! DAGR adds reception of a second encrypted GPS frequency to provide a more reliable and accurate computation of the receiver's current position location. Increased receiver reliability is critical as the electronic atmosphere of the future battlefield will be cluttered with intentional and accidental jamming and spoofing signals.

DAGR also provides a quicker "time to first fix", providing the soldier with an accurate position no later than 1 minute after the receiver is turned on. This rapid acquisition has the added benefit of extending battery

life, reducing the logistical burden on the soldier.

DAGR will increase Situational Awareness for the user through an improved Graphical User Interface. Soldiers will be able to use the DAGR digital display to determine their position relative to known points. Soldiers will also have the ability to determine Static Azimuth using the DAGR. These capabilities will reduce the soldier's need to repeatedly refer to a map or compass while navigating with the DAGR.

What does the First Article award mean?

In October 2002, the GPS Joint Program Office awarded two First Article contracts valued at over \$9 million each to Raytheon and Rockwell-Collins. These First Article awards move the DAGR program from evaluation of sample designs into a more aggressive schedule of testing using "production representative" models. By awarding contracts to two competing firms, the government is able to qualify two potential manufacturer's designs and maintain the beneficial effects of continued competition right up to the point when the DAGR Program Manager awards the production contract. Based on current pricing, the potential value of the production contract, including options, is estimated to be in excess of \$350 million.

Does the DAGR give us an advantage over commercial GPS receivers?

Absolutely! In addition to the ability to utilize two frequencies, quicker "first fix" time and Graphical User Interface features noted above, the DAGR incorporates the DoD's next generation GPS security device known as the Selective Availability Anti-spoofing Module (SAASM). The SAASM will ensure greater security of the GPS encrypted signal and provide increased anti-jam protection over the current PLGR security architecture. It incorporates a tamper-resistant coating that cannot be reverse-engineered in case of enemy capture. In addition, you will be able to load COMSEC to DAGR using unclassified crypto-keys, further reducing the risk of compromise.



No, it's not a DAGR! This is the hand-held radio receiver transmitter (notice the long extendable antenna!), a key element of the new CSEL rescue radio system!

What happens now that The First Article contracts have been awarded?

During the First Article evaluation period, production representative hardware from both contractors will be tested in a variety of technical and field environments. Both firms will have the opportunity to improve the prices proposed for the production contract. The production contract award will be based on the results of the First Article test evaluation, revised prices and the overall "best value" for the US military. The production contract award will include options for up to seven years of production.

When will we see DAGR in the field?

The First Article testing program gets underway early next year. The winning DAGR design will be selected and the production contract awarded in early Fall of 2003. We expect to see DAGR fielding begin in late 2004. It will take several years for DAGR fielding to displace PLGR.

The DAGR program is managed at the GPS Joint Program Office in Los Angeles CA.

The DAGR Project Officer is US ARMY MAJ Keith Hirschman, DSN 833-2925, CML (310) 363-2925, email:
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Combat Survivor Evader Locator (CSEL) Rescue Radio

Like the DAGR program discussed above, the CSEL radio program will soon complete operational test and evaluation, proving it's concept and the use of next-generation technology. The CSEL survival radio system includes a GPS-equipped hand-held radio, UHF SATCOM base stations, rescue center computer workstations and life support radio loading equipment. The system is designed to enable downed aviators to use the hand-held radio to exchange encrypted messages with rescue coordination centers worldwide using military communications satellites.

The CSEL program has resolved development problems and is now focused on operational testing to prove the system's performance and durability. Pentagon approval for full-rate production could come as early as mid-2003. The objective is to procure 53,000 CSEL radios including 18,500 for Army pilots to equip military users with a state-of-the-art rescue radio. The two-way secure data communications using satellite links are CSEL's great advantage over existing survival radios. The CSEL program is managed at the GPS NAVSTAR Joint Program Office. For more information about the CSEL program, contact Major David Micheletti, CSEL Deputy Program Manager, at DSN 833-1058.

Update on the PLGR ANOMALY:

Previous Pathfinder issues explained the existence of two anomalies in PLGR software. Details can be found in the precautionary message at the GPS website. The anomalies do not pose an immediate hazard to users: Conditions that cause the first anomaly have been "temporarily" blocked by JPO actions to modify other elements of the GPS system architecture. Conditions that cause the second anomaly can be avoided by cycling PLGR power every 8 hours when PLGR is operated continuously for more than 8 hours. A proposed field advisory message will address this work-around.

The usual course of action would be for the PLGR manufacturer and the GPS JPO to distribute corrective software to reprogram PLGR in the field. The Army is not using that approach this time around for several reasons:

The temporary fix allows the Army to delay implementing the permanent fix until we can secure additional funding and expand a previously planned reprogramming effort. The Army already plans to reprogram PLGR as part of a refurbishment program in conjunction with DAGR fielding. The current plan is to roll this software upgrade into that effort to make a single cost effective process and reduce or eliminate the logistical burden on field users to administer a field reprogramming effort.

So as the DAGR fielding proceeds, the displaced PLGR will be cycled through the refurbishment program, getting new software in the process. PLGR will then be cascaded to fill outstanding GPS requirements of the National Guard.

In the near term, non-Army organizations with lower densities of fielded PLGR will start reprogramming their PLGR in late FY03 when the corrective software and MWO are fully approved for release. This will include most USAF, Navy, Foreign Military Sale (FMS) and other authorized users. Information about the availability of PLGR Reprogramming kits will be posted to the website and published in this newsletter.

*Point of Contact: Johnny Walker at
Georgia Field Office DSN 468-3288.*

Shortage of Army Handheld GPS (PLGR) Continues

Two factors result in the continuing shortage of Army PLGRs: A lack of equipment to backfill current authorizations and a lack of funds to repair exclusion-damaged PLGRs.

1. Lack of equipment: On one hand we want to move on to the next generation receiver; On the other hand, DAGR fielding won't begin until late FY04 so there is a time gap during which many units do not have full issue of current authorizations for PLGR. PM GPS has purchased as many PLGR as it can in order to fill the gap until we start fielding DAGR. To that end, PM GPS has recently shipped over 3,500 new PLGR for Army organizations at 17 locations world-wide and we are currently processing an additional 2,400 new PLGR for shipment to other units. Even so, that leaves many units short of their authorization and we simply don't have the resources to back fill every unit.

2. Lack of Army depot maintenance funds: The shortage of Army depot maintenance funding means we are continuing to hold damaged PLGRs hostage, neither repairing them nor returning them to the owning unit. This "deferred maintenance program" will continue through this Fiscal Year meaning all PLGRs entering the repair cycle are screened to identify "exclusion to warranty" repairs for PLGRs belonging to "non-priority" units. Those PLGR are set aside. Please remember that PLGR damages covered by the warranty are still repaired and the PLGR is returned to the owning unit. The deferred maintenance program only applies to exclusion damaged PLGRs belonging to "non-priority" units. Even so, there are close to 1200 PLGR in the deferred maintenance program. Read the next article to better understand the deferred maintenance program.

*POC Dennis Rotenberry or Suzanne
Reinhardt Smith DSN 992-5758/6133.*

Update on the PLGR Deferred Maintenance Program

Unfortunately, we do not have good news regarding the deferred maintenance program for FY03. The funding limitation continues for this Fiscal Year (FY) and all Army PLGRs entering the exclusion repair cycle are still subject to the priority repair system. NOTE that warranty repair support continues unchanged! The only difference this FY is that some units that were within two years of becoming a Transformation Unit have now been added to the priority support list.

The process: PM, GPS sends out letters to users whose PLGRs will be placed in deferred maintenance. If you have received one of these letters, it is important that you follow the instructions and submit a requisition. Each letter has a unique code associated with it that is tracked by the PM. Any requisitions that are received for deferred maintenance must have the exact unique code and the correct quantity. Once the PM checks your code and quantity, you are placed on an approved list that will be used to fill these special requisitions. So, please take a few minutes to read the letter and follow the instructions carefully, otherwise, you may not be eligible to get a replacement PLGR under the deferred maintenance program.

*POC Suzanne Reinhart-Smith at Fort
Monmouth NJ DSN 992-5758*

Update on the PLGR External Protection Module

In July 2002 we reported that a Critical Design Review (CDR) for the PLGR External Protection Module (EPM) had been successfully completed. We can now report that the design and production drawing packages are complete. The EPM Development effort is now at the beginning of the prototype fabrication stage. Six prototypes will be installed and tested in TF XXI vehicles and will undergo environmental qualification testing at Electronic Proving Ground (EPG), Ft. Huachuca AZ. Upon successful completion of testing, PM GPS will make EPMs available as soon as possible.

To refresh your memory, the EPM is a compact attachment for the back of the PLGR. It is designed to eliminate damage that occurs to the PLGR or Appliqué Computer when voltage transients occur over the J2 Serial Port cable. In addition, the EPM has built-in reverse bias protection so the PLGR will not be damaged if the external power cable is connected incorrectly to the battery box. It has an LED indicator that will let you know if the external power cable has been connected incorrectly. Integrated grounding and EMI filtering is included so you no longer need to use the Hoffman Plate. Finally, there is a switch that will allow you to perform a functional test of the serial data port (RS-422 or RS-232) so you will no longer need a separate serial port tester.

*Mr. William Burnette, Jr. at
Georgia Field Office, DSN 468-1109.*

HOW TO CONTACT US

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Or contact the Pathfinder editor via email address at front of newsletter and we will route your question to the appropriate office for response.

NOTICE: Army PM GPS staff at Fort Monmouth is changing internet servers and CECOM does NOT forward email from old to new. If you attempt to reach us by email you may not even get a rejection notice! Our email addresses are being changed from "mail1" to "iew.s" just after the "at sign" in our address. We apologize for the inconvenience and ask you to keep trying if you need assistance!

Who To Call?

- For GPS integration assistance and new product information, call TMD.
- For sustainment issues including help with software, supply, technical publications, accessory procurement and training call GFO.
- For equipment authorizations, fielding, host vehicle installation and New Equipment Training call RMD.

Do You Have Current PLGR Software?

There are two versions of software for each version of PLGR hardware in the field. Both versions work the same with no impact on the user or integrations. If your PLGR displays one of these version numbers on start-up, you are “okay”

For Baseline II PLGR (most tan PLGR):

613-9854-**003** Or 613-9854-**004**

For Baseline III and above PLGR (most green PLGR):

613-9544-**008** Or 613-9544-**009**

Note 1: PLGR entering depot repair automatically get latest version software.

Note 2: Units operating PLGR+96 Software for the Laser Rangefinder systems should be using software version 613-9868-**006**

So check your PLGR! If it displays any other version number, contact PM GPS by phone or email to determine which version you should have and how to obtain it.

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